GLOBE Learning Communities (GLC) and Pre-service Education in Thailand

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GLOBE Learning Communities

1. *Initial history of community outreach : what first motivated you to , what proved to be the essential driving factor to first form the GLC , can you identify any one person or group who was instrumental in forming , what reasons were behind first community involvement*

   Realizing that GLOBE is real science and real education, the success of GLOBE implementation in our country depends largely on the students' ability to perform science. They must be able to do inquiry using scientific process and scientific thinking in doing actual practices in natural setting, as well as using science background to interpret, explain, predict the relationships, identify anomalies and research questions and to design investigations by themselves. We believe that working with scientists will enable the students to do inquiry, to understand how scientist produce science, to be confident that they can produce science themselves, and best of all, to develop spirit of science. So we first form the GLC with the student – scientist collaboration researches, focusing on local environment to benefit their communities. The scientists from local GLOBE university partners; government agencies, e.g. Land Development Department, Meteorological Department, and Water Pollution control Department; non-government organizations; and people who own local wisdom were involved.

2. *Description of all community outreach activities of GLC, including how these activities are funded , how their effectiveness is evaluated , and methods of sustaining the activities*

All Community outreach activities of GLC in Thailand include:

1. Student – scientist collaboration research

- working with NASA soil scientists, university scientist, local NGO scientist and IPST GLOBE team
  - using automated data logger to collect data on soil moisture, soil temperature and air temperature to join the research on GAPS – General Purpose Simulation Model of the Atmosphere – Plant – Soil System (on going)

- working with university scientists and NGO scientist and IPST GLOBE team for the research on "the Effect of Soil Physical Properties on the Soil Water Drainage "

- working with local university scientists
  - 10 local universities
  - about 50 activities on going
  - about more 50 activities by 2005

- working with local NGO scientists
  - 3 local NGO scientists
  - about 10 activities on going
  - about more 20 activities by 2005

- working with local government agency scientists
  - 50 local Land Development Department scientists (50 provinces), about 50 activities in 2005 (future plan)
  - 50 local Meteorological Department scientists (50 provinces), about 50 activities in 2005 (future plan)
  - 50 local Water Pollution Control Department scientists (50 provinces), about 50 activities in 2005 (future plan)

- working with local scientists of Royal Development Project regarding Environment scientists
  - at Khao Hin Sorn Royal Development Study Center, Chachoeng Sao province which aims to conduct study and research on establishing the soil and water conservation system (about 3 activities – future plan)

- at Pikun Thong Royal Development Study Center, Narathivas province which aims to conduct study on peat soil (about 3 activities – future plan)

- at Huai Hong Khrai Royal Development Study Center, Chiangmai Province which aims to conduct research on appropriate patterns of development of watershed areas for various development patterns which enable the people to be self – reliant without having to destroy nature , while encouraging them to conserve watershed and develop forest simultaneously. (about 3 activities – future plan)

- at Huai Lan Royal Development Project, Chiangmai Province which aims to rehabilitate, improve and restore the forests to their fertile conditions, especially at maintaining the watershed areas for protection against flooding (about 3 activities – future plan)

- at Huai Sai Royal Development Study Center which aims to conserve top soil to solve the problem of deforestation, soil erosion in the dry and sandy soil due to pineapple cultivation, compact clay, infertile soil and severe drought. (about 3 activities – future plan)

- at experimentation centers on the cultivation of vetiver grass which aims to control soil erosion and maintenance of soil moisture (about 3 activities – future plan)

- working with local people who own local wisdom
  - working with farmers and local people to help solving soil problems. As “Young Soil Doctors” who help curing soil illness (about 3 activities – future plan)

How these activities are funded?

They are funded by IPST through the government support.

How their effectiveness is evaluated?

The effectiveness, of those activities is evaluated by students investigations or research findings, the understanding of students on their local environments the applicability of those findings to help solving the problem of their local environment , the ability of the

student to do science by scientific inquiry , to think critically, evaluatively and the spirit of science of the students.

Method of sustaining the activities

- Arrange GLC Workshop for scientists from local universities, government agencies , NGO's, local people, farmers, volunteer soil doctors, and GLOBE teachers to share expertise, resources, common commitment to support teachers and students in the implementation of GLOBE in their communities, successful GLC activities, new ideas, collaborations and funding opportunities

- Arrange GLOBE Student Conference for students, teachers , and scientists from universities, government agencies, NGO's, local people, farmers, and volunteer soil doctors to provide opportunities for students to present GLOBE investigations / researches, share learning experiences, and establish collaborations among the people mentioned.

3. *How can it be a good example for other partnerships , what innovative practice may inspire others , what issues have you been able to address with your community outreach activities*

How can it be a good example for other partnerships?

It can be a good example for other partnerships for using GLOBE real science investigation to tie GLC to strengthen their capacity in consciousness raising activities, including science education for sustainable development. Broad expertise, resources and experiences of the GLC will be pooled and focus on a common commitment. The students and teachers will gain teaching-learning experiences to acquire knowledge by scientific inquiry, to understand nature of science, to develop spirit of science which are the ultimate goal of National Science Education Standard. The students and teachers will be able to identify and help solving their local environmental problems with their scientific thinking and will be confident to learn by themselves, and be able to make some contributions concerning the environment to their own communities.

What innovative practice may inspire others?

1. Strengthen the capacities of GLOBE concerned people
    - Organize GLOBE sensitization and awareness programs for different groups including private sectors, policy and decision makers, community leaders.
    - Encourage the development of testing, production and dissemination of GLOBE innovative educational materials suited to local context.

2. Develop more and sustain GLOBE partnership for collaborative works
    - Involves all stakeholders in GLOBE preparing and implementing collaborative projects.
    - Formulate and conduct specific pilot / demonstration activities.

3. Develop a professional development project at all levels
    - Develop GLOBE – Local curriculum integration materials and resources
    - Develop GLOBE case studies of successful practices
    - Establish professional development network for environmental educators and facilitators to explore innovative GLOBE implementation strategies
    - Eevelop GLOBE **informal education** to provide learners to learn by themselves according to their interests, potential, readiness and the opportunity available from individual society, environment, media or other sources
    - Eevelop GLOBE **nonformal education service** – flexibility in determining the aims, management, procedure, duration, assessment and evaluation conditional to its completion, appropriate respond to the requirements and meet the needs of individual group of learners

What issues have you been able to address with your outreach activities?

The major issue concerns the lack of understanding of GLOBE philosophy measurement protocols, investigation strategies, standard equipments, and ICT skills of the GLC.

The Institute for the Promotion of Teaching Science and Technology (IPST) as GLOBE Thailand country coordinating and implementing agency has address this issue by cooperating with the land Development Department to arrange the GLOBE workshop to share GLOBE philosophy and implementation strategies with the 12 soil scientists at 12 main Land Development Department stations all over Thailand to help spread out the disseminations of GLOBE program to the 160 local soil scientists at 72 soil

stations all over Thailand to work with the GLOBE students as student-scientist collaboration researches on their local soil problems.

4. *Lessons learned from your experienced, do's and don'ts, remaining challenges, advice for others*

Don't - just using students as a tool, to try to solve problems of the actual community which the adult society is not able to handle.

Do - respect for their long term function as thinking, acting and critical citizens in the future community. This is definitely needed if they shall participate in shaping the future.

Don't - approach "From Society to School" don't let the society put too many "prescribed good things" to the students and teachers that they don't find important or superficially find important as rewards or prestiges for themselves or for their schools. Which they don't really understand and get confusing

Do - approach "From School to Society" the student can work with how they can make use of the local community to try to solve problems the students find important

Don't - restrict to the myth that learner centered teaching of the environment is just superficial group work, practical activities, outdoor education for just to get the isolated facts

Do - think critically and evaluatively on the philosophy behind learner centered teaching on the environment. It is the must to understand "Environment", "Environmental sciences", "Nature", "Earth as a System", "Nature of Science", "Scientific Inquiry", "Scientific Thinking", "Spirit of Science", "Higher Order of Thinking", "Learner Centered", "Local Wisdom", "Learning Community" and "National Science Education Standard" all of those things underlie the philosophy of GLOBE which will lead to the true learner centered teaching on the environment.

Don't - use "impossible", "unrealistic", "unscientific", "superficial" and "mass" implementation approach just only for popularization or prestige of whoever concerned.

Do - use scientific judgement to very carefully justify the merit of something to be implemented, the appropriate of implementation strategies and the value of implementation results before taking action.

GLOBE Preservice Education in Thailand

1. *Initial history of community outreach : what first motivated you to , what proved to be the essential driving factor to first form the GLC , can you identify any one person or group who was instrumental in forming , what reasons were behind first community involvement.*
2. *Description of all community outreach activities of GLC, including how these activities are funded , how their effectiveness in evaluated , and methods of sustaining the activities*
3. *How can it be a good example for other partnerships , what innovative practice may inspire others , what issues have you been able to address with your community outreach activities*
4. *Lessons learned from your experienced, do's and don'ts, remaining challenges, advice for others*

Realizing that GLOBE is valuable science education program. GLOBE focus on students and teachers involvement in searching knowledge about nature, started from local environment to global environment by themselves. In doing so students need scientific mind, scientific thinking to use scientific inquiry and science process skills. Those scientific behaviors can be nurtured, facilitated and mentored by education. To implement GLOBE effectively up to its highest value, it needs to empower the teachers to be able to help the students to develop those valuable behaviors. The Institule for the Promotion of Teaching Science and Technology, IPST, as a country coordinator of GLOBE Thailand and responsible for inservice teacher education has tried her best to facilitate the teachers to meet these goals with the cooperation of the 10 university partners.

In the first stage, because of the limitation of resources and time, IPST started inserviec training with protocol training, then move up to inquiry and research skills, GLC researches approaches, specific pilot/demonstration approach and case studies of successful practices, the first group trainers were IPST staffs and then joined with university instructors from the faculty of science with different science backgrounds. In the near future the instructors from the faculty of education of the same partner universities will be selected to be trained as the GLOBE trainers. It is needed to be concentrated on the same universities for the reason that to strengthen the capacity of training of the nucleus group in the same university who can share experiences closely and easily and to save sharing the resources and times.

The next step, parallel with field based inservice training, the power of preservice education for GLOBE implementation is realized. But the resources and time are still the limitation factors, so IPST will focus the preservice education on the encouraging of the development of testing production and dissemination of

innovation educational materials suited to local context, examples of specific pilot/demonstration, case studies of successful practices will be provided for preservice education. The instructors from the faculty of education of the same partner university will be aimed to use those materials and resources to train their students (preservice student teachers) to learn GLOBE with the hope that those preservice student teachers will have GLOBE background before they come to the inservice after the graduation and will be selected to be trained as efficient GLOBE trainers in the future.